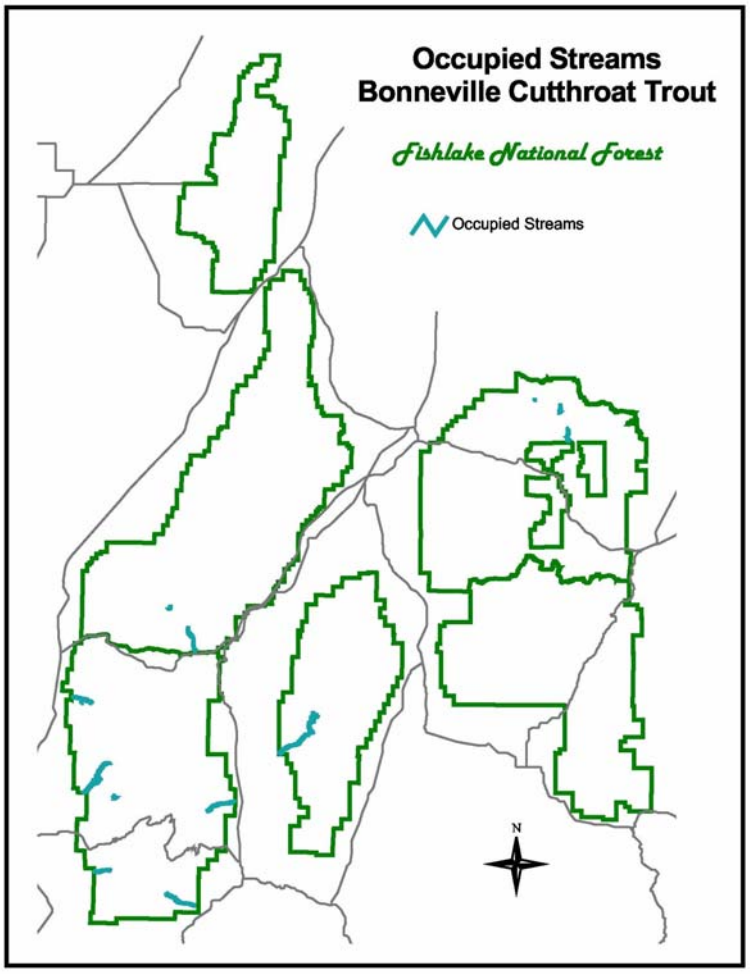
SENSITIVE FISH SPECIES

Bonneville Cutthroat Trout *(Oncorhynchus clarki utah)*

Bonneville cutthroat trout is one of three cutthroat trout subspecies native to Utah. Bonneville cutthroat trout historically occurred in the Pleistocene Lake Bonneville basin, which included portions of Idaho, Nevada, Utah, and Wyoming (Kershner 1995). The desiccation of Lake Bonneville into the smaller Great Salt Lake and fragmentation of other stream and lake habitats may have led to three slightly differentiated groups of Bonneville cutthroat trout from the Bear River basin, the Bonneville basin proper, and the Snake Valley (Behnke 1992). There are five known populations of pure strain Bonneville cutthroat trout on the Fishlake National Forest inhabiting approximately 38 miles of stream habitat.

The map below displays 38 miles of occupied Bonneville cutthroat trout habitat on the Fishlake National Forest.



Habitat for the Bonneville cutthroat trout is widely distributed and variable. It ranges from high elevation (3,500 m mean sea level) streams with coniferous and deciduous riparian trees to low elevation (1,000 m mean sea level) streams in sage-steppe grasslands containing herbaceous riparian zones (Kershner 1995). As such, Bonneville cutthroat trout have adapted to a broad spectrum of habitat conditions throughout their range.

Sexual maturity is typically reached during the second year for males and the third year for females (May et al. 1978). Both the age at maturity and the annual timing of spawning vary geographically with elevation, temperature, and life history strategy. Lake resident trout may begin spawning at two years and usually continue throughout their lives, while adfluvial individuals may not spawn for several years. Annual spawning of Bonneville cutthroat trout usually occurs in the spring and early summer at higher elevations (Behnke 1980) at temperatures ranging from 4-10 degrees C (May et al. 1978). May et al. (1978) reported Bonneville cutthroat trout spawning in Birch Creek, Utah beginning in May and continuing into June. The wild brook stock at Manning Meadow Reservoir (9,500 ft. elevation) spawn from late June to early July (Hepworth and Ottenbacher 1995).

Fecundity is typically between 1800-200 eggs per kilogram of bodyweight (Behnke 1992). Incubation times for wild Bonneville cutthroat trout have not been verified but probably average 30 days (Gresswell and Varley 1988). Fry emerge in mid July through mid August (depending on spawning time) and migrate to channel margin habitats associated with stream banks (Moore and Gregory 1988). Growth of resident fish is highly dependent on stream productivity. Growth rates of Bonneville cutthroat trout tend to be slower in headwater drainages than in lacustrine environments. Because Bonneville cutthroat trout may be adapted to the rigorous conditions of high elevation headwater streams, these fish may have a competitive edge over nonnative salmonids in those areas (Binns 1981).

Bonneville cutthroat trout require relatively cool, well oxygenated, water and the presence of clean, well-sorted gravels with minimal fine sediments for successful spawning.

Both terrestrial and aquatic invertebrates are important food items for stream-dwelling Bonneville cutthroat trout (May et al. 1978, Binns 1981). Their diet was diverse during the summer in Birch Creek (May et al. 1978). Dipterans and debris were the dominant food items for immature trout and terrestrial insects were the dominant prey for mature individuals.

There are numerous threats to Bonneville cutthroat trout. These include hybridization and/or competition with nonnative salmonids, degradation of habitat from diversions, livestock grazing, road building, fire, mining and timber harvest activities, as well as angling.

Colorado River Cutthroat Trout *(Oncorhynchus clarki pleuriticus*)

Colorado River cutthroat trout is one of three cutthroat subspecies native to Utah. Historically, the subspecies occupied portions of the Colorado drainage in Wyoming, Colorado, Utah, Arizona, and New Mexico (Behnke 1992). Though it is now restricted to headwater streams and lakes, its original distribution included portions of the Colorado and Green River drainages. Although reduced in range and numbers, pure populations of Colorado River cutthroat trout still exist in their native drainages. There are three known populations of pure strain Colorado River cutthroat trout on the Fishlake National Forest inhabiting approximately 8 miles of stream habitat.

Populations may be lake resident, fluvial or adfluvial, and life history characteristics vary somewhat between these strategies. Colorado River cutthroat trout appear to be slower growing than other subspecies with few fish over 200 mm, probably because of the short growing season. However, Colorado River cutthroat trout transplanted to lower elevation ponds grew to nearly 400 mm in two years and were commonly over 250 mm in tributaries to the Green river in Wyoming, especially where fish were associated with beaver ponds (Young 1995). Lacustrine populations of Colorado River cutthroat trout averaged 325 mm at age three.

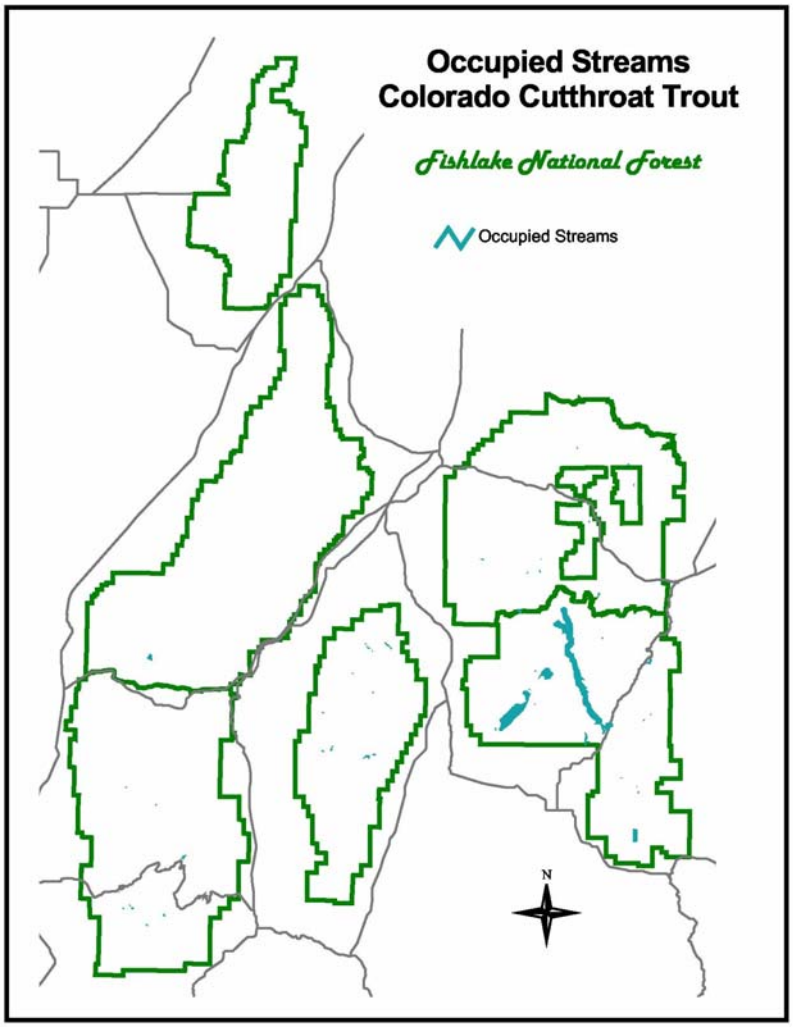
Spawning for Colorado River cutthroat trout usually begins when spring floods begin to recede in late spring and early summer possibly cued by changes in water temperature. Fecundity varies with individual size and location as well as life history. Water temperature, elevation and climatic variation determines fry emergence. Emergence usually occurs in late summer for known populations. Maturity is thought to be reached at approximately three years of age for lotic populations.

Habitat requirements for Colorado River cutthroat trout are poorly understood, and results of studies are frequently conflicting. Typical of most cutthroat species, Colorado River cutthroat trout spawn over gravel substrates with good water through-flow. Coarse woody debris, greater depth and lower velocities have been found to be positively associated with Colorado River cutthroat trout presence; however, these conditions were not readily available within many streams containing Colorado River cutthroat trout. Most conclusions on habitat requirements are confounded by small population size and restricted habitat areas.

Colorado River cutthroat trout do not appear to compete well with introduced salmonids. This is possibly due to having evolved with mottled sculpin and several endemic Colorado River minnows and suckers, not with other salmonids.

Diets of subadult Colorado River cutthroat trout comprise mainly of macroinvertebrates and plankton, whereas adults can be piscivorous with a larger proportion of large macroinvertebrates and terrestrial insects in their diets than that of subadults.

The Colorado River cutthroat trout only occurs on the Loa Ranger District of the Fishlake National Forest.



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